Recent Developments in Construction Activity

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DURING the first half of 1939, construction work was initiated in large volume in comparison with corresponding periods of recent years. The total value of construction contracts awarded, as reported by the F. W. Dodge Corporation, was 31 percent higher than during the first 6 months of 1938, and was larger than for any corresponding period since 1931. As Figure 6 shows, however, the movement of construction contracts

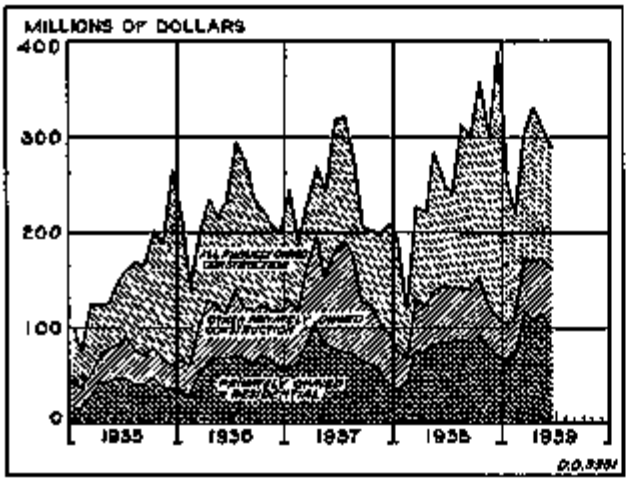

Figure 6.—Construction Contracts Awarded in 37 Eastern States, 1935–39. (F. W. Dodge Corporation.)

since the beginning of 1938 has not been continuously upward. Recovery from the recession of 1937 began in the first quarter of 1938, and the volume of construction contracts increased with only minor interruptions from February through December. During the first few months of this period a seasonal expansion was to be expected, and the actual increase was probably of about the magnitude of the usual seasonal change. In the third quarter, however, the increase was more rapid, and continued after a seasonal decline would ordinarily have taken place. Until August, the increase was shared about equally by public and private work, but the subsequent upward movement resulted almost wholly from the expanding volume of contracts awarded under the 1938 Public Works Administration program. After December, as the award of contracts under the P. W. A. program was brought to completion, the value of contracts declined, though exceeding the total for the first half of 1938 by a considerable margin.

In consequence of recent movements, it seems probable that the volume of contracts for the entire year will not make nearly so favorable a showing in comparison with 1938 as has been made by the first 6 months. In fact, if contract awards during the last 6 months of the year merely follow the usual seasonal pattern, starting from the present level, it is likely that total contracts for the year will increase little, if any, over 1938. A substantial increase for the year as a whole will take place only if there is a definite increase in the volume of new work initiated, after allowance for the usual seasonal changes. In any event, an upward movement as large and as rapid as that which occurred in the final months of 1938 seems improbable.

The behavior of contracts for residential building has resembled to some extent the behavior of total contracts. Figure 7 presents data on the value of residential contracts, as adjusted for seasonal variation by the Board of Governors of the Federal Reserve System. This seasonally adjusted series rose sharply from January through September 1938, and then rose more slowly until March of this year. Since that time there has been no further advance, when allowance is made for the usual seasonal changes. For the first 6 months of 1939, residential contracts have increased

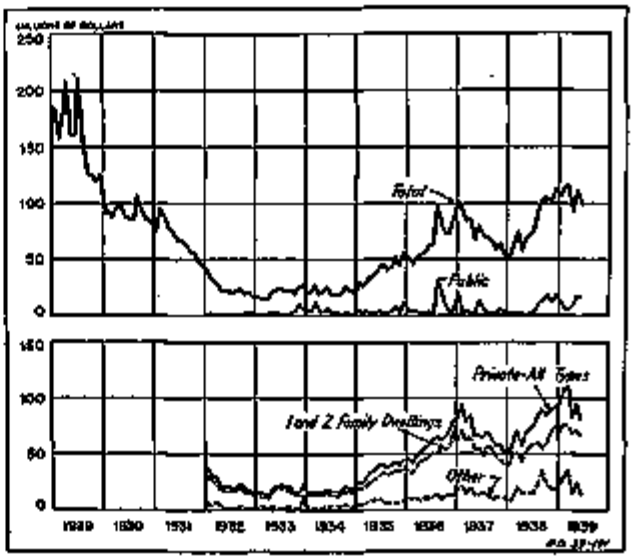

Figure 7.—Residential Building Contracts Awarded in 37 Eastern States, Adjusted for Seasonal Variation, 1929–39.

Source: Compiled by the F. W. Dodge Corporation and adjusted for seasonal variation by the Board of Governors of the Federal Reserve System.

nearly two-thirds over the first half of 1938. If, during the remainder of the year, residential contracts should follow the expected seasonal changes, and should continue, after adjustment for seasonal variation, the recent sidewise movements, the increase for the year as a whole would be about half that shown for the first 6 months.

Two sustaining factors in residential construction, which are likely to make their influence felt in the near future, may aid in maintaining the present rate of increase. It is probable that contracts for public residential construction will be substantially larger during the latter part of the year than they were for the first 6 months. Under the program of the United States Housing Authority work may be started on as many as 50,000 family dwelling units, or about three times as many as were started under this program during the first half of the year. In addition, a certain amount of privately financed rental housing which was delayed from the first half of the year will go under construction in the second half. This latter category includes a group of projects to be constructed under the mortgage insurance program of the Federal Housing Administration. They were withheld during the consideration of amendments to the legislation under which the Federal Housing Administration operates, but have since been released and construction will probably be started on these projects in the autumn. In view of the expansion which will probably come from these two sources, especially the first, residential contracts as a whole are likely to rise somewhat, after allowance for seasonal variation, unless private construction of one-family and two-family houses should decline substantially.

Contracts for most other major types of construction have shared in the increase from 1938 to 1939, though the increase for residential construction has been considerably larger than that for any other important category. Contracts awarded for commercial building have increased about 10 percent, comparing the first half of 1939 with the first half of 1938, while contracts for factory construction have increased nearly one-third. In both cases, the volume of work initiated so far in 1939 has been substantially less than in the first half of 1937, when construction of these two types was relatively active. Contract awards for other nonresidential building have increased 20 percent, for public works 20 percent, and for utilities (both public and private) 7 percent.

Construction Expenditures During the First Half of 1939

The comparisons given above have been made in terms of the value of work started during the period, as measured by its expected final cost. Measurements of construction may also be made on a different basis—that of current construction activity as represented by actual expenditures for labor, materials, and other items. On this basis, it is probable that the first 6 months of 1939 made an even more favorable comparison with the first 6 months of 1938. Direct measures of current construction activity are not available on a comprehensive basis for any period shorter than a year. However, some indirect indications may be derived for certain parts of the construction field. A rough estimate for residential construction, based on the amount of work started in each month and on an approximation of the lag between the start of work and its completion, suggests that this type of work was substantially more active in the first half of 1939 than in the corresponding period of 1938.[1] Similar estimates for commercial building and factory construction, on the other hand, indicate that the volume of current activity for these types of work has been less in 1939 than in 1938.[2] These categories are relatively less important than residential construction.

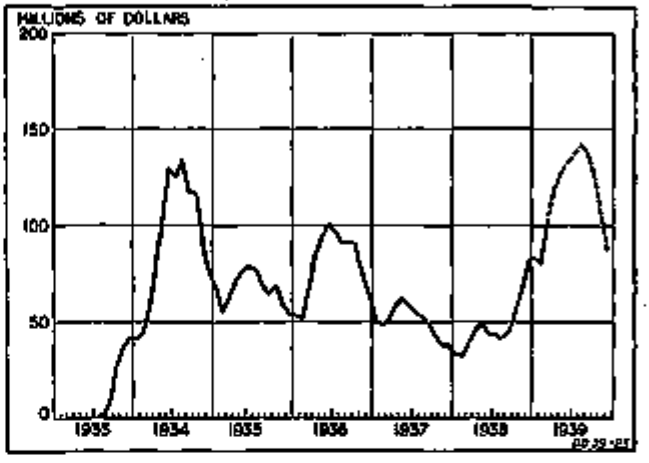

Figure 8.—Reported Project Costs for All Public Works Administration Programs, Both Federal and Non-Federal, for which Appropriations Were Provided Prior to 1939, By Months, July 1933 Through December 1939. (Public Works Administration.)

NOTE.—Reported project costs represent the estimated costs of materials in place (including cost of labor performed) and miscellaneous costs for that portion of the construction project that was completed during the month. This chart shows only the reported project costs under programs authorized prior to 1939. Data for April through December 1939 are estimates of the Public Works Administration. Figures for July 1938–December 1939 have been revised since presentation in the May 1939 issue of the Survey.

For several types of public construction, estimates of current activity rest on a fairly substantial basis. During the first 4 months of 1939, activity in construction financed from regular Federal appropriations, which excludes work under the program of the Public Works Administration, was roughly 10 percent above the corresponding period of the preceding year, as measured by the expenditures for pay roll and materials within this period reported to the Bureau of Labor Statistics.[3] During the first half of the year, however, activity in State road construction financed wholly from State funds (principally maintenance work) was 2 percent below the first half of 1938, as measured by pay-roll expenditures reported to the same source. For that part of all public construction carried on under the Public Works Administration program, the level of activity in 1939 is directly measurable. Figure 8 shows the reported project costs of work under this program

[1] This computation was based on the number of new dwelling units started in all urban areas, as estimated monthly by the Bureau of Labor Statistics.

[2] This computation was based on F. W. Dodge Corporation figures for contracts awarded in 37 eastern States.

[3] In this comparison, forestry and shipbuilding have been omitted from the items classified by the Bureau of Labor Statistics as construction.

from 1933 through March 1939, with estimates up to the end of the year. Under requirements of the law authorizing the 1938 program, it was necessary that all of these projects be started before the end of 1938, but no large volume of work was done on them until the last 2 months of the year, and the peak of activity is not expected to be reached until August of 1939. For the first half of 1939 these reported project costs are estimated to total about $650,000,000, or more than two and one-half times the total for the corresponding period of a year ago. Construction expenditures on Works Progress Administration projects were also substantially higher during the first 6 months of 1939 than in the corresponding period of 1938, increasing from about $520,000,000 to about $650,000,000. For the last half of 1939, however, these expenditures are likely to decrease.

Judging by the volume of work, both public and private, which has already been started, and by the current rate of initiation of new projects, it appears likely that a relatively high volume of construction activity will continue until at least the end of this year. Beyond that time, activity will depend more upon the rate at which new work is begun during or after the last half of 1939 than upon any events concerning which information is now available.

Revised Estimates for 1938

The increase in construction activity during the first half of 1939 over the corresponding period of the previous year continued a rise in construction expenditures that has been uninterrupted, on an annual basis, since 1933. Activity in 1938 was the highest since 1930; although it was less than two-thirds of the average for the years 1926–28—the post-war peak. These comparisons are based on the revised estimates of construction activity for 1938 prepared by the Bureau of Foreign and Domestic Commerce, which are presented in some detail in the accompanying tables.[4]

The revised estimates bear out the preliminary data in indicating that total activity, including maintenance and work relief, was greater in 1938 than in 1937. The business recession that began in 1937, which is clearly apparent in monthly figures for construction work started (see figs. 6 and 7), is reflected in annual data on construction activity in the form of a change in the composition of the total, rather than as an actual decline. Certain important segments of construction activity shared in the general business recession. Expenditures for private construction as a whole were less in 1938 than in 1937, and total construction expenditures increased only because the expansion in public construction more than counterbalanced the contraction in private work.

Table 1.—Estimated Value of Private and Public Construction, Including New Construction, Maintenance, and Work Relief Construction [1]

[Millions of dollars]

Items	1932	1933	1934	1935	1936	1937	1938
New construction, total	[2] 2,561	[2] 2,307	[2] 2,701	[2] 3,023	[2] 4,705	[2] 5,340	[2] 5,264
Private	[2] 1,767	[2] 1,091	[2] 1,282	[2] 1,605	[2] 2,551	[2] 3,326	[2] 3,107
Public, total	[2] 1,794	[2] 1,216	[2] 1,419	[2] 1,428	[2] 2,154	[2] 2,014	[2] 2,157
Non-Federal	[2] 1,334	[2] 707	[2] 794	[2] 618	[2] 881	[2] 845	[2] 1,060
Federal	460	509	[2] 605	[2] 812	[2] 1,273	[2] 1,169	[2] 1,096
Work-relief, Federal (public)[3]	.....	114	578	499	1,180	775	[2] 1,203
Maintenance, total	[2] 1,782	[2] 1,542	[2] 1,703	2,013	[2] 2,452	[2] 2,673	[2] 2,573
Private	[2] 1,128	[2] 1,015	[2] 1,104	1,413	[2] 1,742	[2] 1,934	[2] 1,837
Public, total	654	527	599	649	710	[2] 718	[2] 736
Non-Federal	561	459	553	598	664	659	[2] 674
Federal	43	42	46	51	56	[2] 59	[2] 62
Total construction	[2] 5,343	[2] 3,964	[2] 5,002	[2] 5,422	[2] 8,287	[2] 8,467	[2] 9,039
Private	[2] 2,895	[2] 2,107	[2] 2,426	[2] 3,018	[2] 4,293	[2] 5,190	[2] 4,944
Public, total	[2] 2,448	[2] 1,857	[2] 2,536	[2] 2,474	[2] 3,994	[2] 3,807	[2] 4,095
Non-Federal	[2] 1,915	[2] 1,182	[2] 1,347	[2] 1,205	[2] 1,535	[2] 1,504	[2] 1,763
Federal	533	665	[2] 1,189	[2] 1,269	[2] 2,459	[2] 2,303	[2] 2,332

[1] Figures for 1915–31, substantially comparable with those presented above, are shown in tables 3a, 4, 5, and 8, pp. 19 to 24 inclusive, in Domestic Commerce Series No. 90, Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce.
[2] Revised.
[3] Work-relief not elsewhere included. See table 7.

Table 2.—Estimated Value of New Private Construction, by Principle Uses or Functions of Projects [1] (Excluding Public Utility Construction)

[Millions of dollars]

Uses or functions	1932	1933	1934	1935	1936	1937	1938
Residential (nonfarm)	641	314	272	533	1,101	1,293	[2] 1,409
Commercial	[2] 263	[2] 135	[2] 167	[2] 204	[2] 268	[2] 280	339
Factory	[2] 78	[2] 128	[2] 173	[2] 186	[2] 222	[2] 201	221
Religious and memorial	[2] 49	[2] 25	[2] 22	[2] 25	[2] 32	[2] 42	49
Educational	[2] 46	[2] 17	[2] 26	[2] 27	[2] 61	[2] 40	42
Social and recreational	[2] 64	[2] 27	[2] 31	[2] 27	[2] 49	[2] 69	74
Hospital and institutional	[2] 32	[2] 18	[2] 15	[2] 11	[2] 28	[2] 27	34
Miscellaneous	[2] 20	[2] 26	[2] 28	[2] 21	[2] 21	[2] 17	28
Total nonresidential building	[2] 551	[2] 387	[2] 464	[2] 502	[2] 674	[2] 982	786
Deduct nonresidential building by utilities	22	10	11	12	16	20	24
Total private nonresidential building [3]	[2] 529	[2] 347	[2] 453	[2] 490	[2] 658	[2] 953	[2] 762
Farm construction (includes repairs)	125	175	200	284	328	380	[2] 335
Total private construction [3]	[2] 1,305	[2] 845	[2] 925	[2] 1,287	[2] 2,087	[2] 2,626	[2] 2,507

[1] Figures for 1915–31, substantially comparable with those presented above, are shown in table 1, p. 12, Domestic Commerce Series No. 90, Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce.
[2] Revised.
[3] Excludes all public utility construction.

The decrease in private construction was much larger for new work than for maintenance. Moreover, there were marked differences in behavior between new residential building and construction of types more closely related to current business activity. Expenditures for new residential construction increased 8 percent in 1938 as compared with 1937; meanwhile, expenditures for new commercial building fell 12 percent and for new factory building 43 percent. New construction by public utilities also was lower. Railroad construction, responding to a sharply reduced volume of traffic and to large reductions in income, decreased 40 percent to a point only slightly above the low totals for 1933 and 1935. On the other hand, construction

[4] Preliminary estimates for 1938 were published in Construction Trends in the United States, 1937 and 1938, by Harold Wolkind, Survey of Current Business, December 1938. For annual figures back to 1915, and for a complete discussion of the concepts, scope, limitations, and sources of the estimates, refer to Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce as Domestic Commerce Series No. 90, copies of which may be purchased from the Superintendent of Documents for 15 cents each.

by electric-power producers and distributors increased over 1937, and construction by telephone and telegraph companies, while less than in 1937, decreased by a relatively small amount. For both the electric-power and telephone companies the volume of business and the rate of earnings in 1938 were not far below the levels of the previous year.

Table 3.—Estimated Value of New Public-Utility Construction, by Principal Uses or Functions of Projects [1] (Private Ownership Only)

[Millions of dollars]

Uses or functions	1932	1933	1934	1935	1936	1937	1938
Railroad transportation	139	94	128	116	149	190	119
Street railways and subways	29	21	80	40	45	30	41
Pipe-line transportation	[2] 37	[2] 7	[2] 12	[2] 20	[2] 41	[2] 67	21
Light and power production and distribution	125	62	57	73	106	172	182
Gas production and distribution	50	20	32	34	54	68	45
Telephone and telegraph communication	85	45	48	53	67	105	92
Total	[2] 462	[2] 246	[2] 307	[2] 338	[2] 464	[2] 640	[2] 508

[1] Comparable figures for 1915–31, inclusive, are shown in table 2, p. 14, Domestic Commerce Series No. 99, Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce.
[2] Revised.

Expenditures for new construction by governmental agencies increased about 7 percent, largely in consequence of the policy of using expanded public expenditures to promote recovery from the business recession that began in 1937. Some of this increase reflects the 1938 program of the Public Works Administration, which was started about the middle of the year; though, as indicated above, the full effect of the P. W. A. program on actual expenditures for construction was not felt during 1938. Also, the expansion of construction operations by the Works Progress Administration probably contributed some small amount to this increase in the figures for new construction, despite the fact that most of the expenditures on Works Progress Administration projects are included in a separate category of the estimates (see table 7). Finally, some part of the increase is probably associated with the better fiscal position of State and local governments which resulted from the improvement in business activity and individual incomes in 1936 and 1937. The principal increases in new public construction, whether as a result of the P. W. A. program or of other factors, were in highway construction and educational building. The expansion in military and naval construction, while small in comparison with increases in other items, brought construction for this purpose to the highest level since 1920.

The possibilities of immediate expansion in public construction are much greater in public works of the type carried on by the Works Progress Administration than in construction of the types appearing in the P. W. A. program or in regular construction budgets. Between 1937 and 1938, construction expenditures by the Works Progress Administration increased by almost one-half, and accounted for about three-quarters of the total increase in public construction. How these expenditures were distributed between new construction and maintenance is not known in detail; though, as has already been pointed out, about 10 percent of these work-relief expenditures for construction are included in our estimates of new construction. It is probable that a further part of the Works Progress Administration construction is actually new work, which should be included in the figures for new construction to arrive at a complete total. Taking this into account, it seems likely that expenditures for new public construction increased between 1937 and 1938 by a somewhat larger amount than is shown in these estimates. The extent of the change in the physical volume of work done, however, as distinct from the change in the amount of expenditures, is not so clear, because of the difficulty of evaluating work-relief construction in comparison with other types of public construction.

Table 4.—Estimated Value of New Public Construction by Principal Uses or Functions of Projects [1] (Excluding Work-Relief Construction)

[Millions of dollars]

Uses or functions	1932	1933	1934	1935	1936	1937	1938
Highway	916	678	831	692	878	[2] 848	900
Sewage disposal	69	24	[2] 64	[2] 68	[2] 115	[2] 105	95
Water supply	57	47	[2] 65	[2] 69	[2] 93	[2] 78	90
Public buildings	[2] 178	[2] 90	[2] 48	[2] 73	[2] 129	[2] 112	124
Educational	[2] 133	[2] 44	[2] 80	[2] 111	[2] 287	[2] 230	281
Hospital and institutional	[2] 76	[2] 35	[2] 34	[2] 30	[2] 61	[2] 63	79
Social and recreational	[2] 28	[2] 13	[2] 21	[2] 25	[2] 45	[2] 40	49
Total nonresidential building	[2] 406	[2] 191	[2] 180	[2] 239	[2] 521	[2] 440	543
Residential			1	9	61	65	52
Military and naval	34	36	47	37	29	[2] 57	62
Conservation and development (Federal)	139	168	[2] 245	[2] 317	[2] 296	[2] 300	314
Miscellaneous public service enterprises	[2] 135	[2] 61	[2] 41	[2] 48	116	[2] 99	109
All other Federal	9	4	5	8	7	10	22
Total new public construction	[2] 1,794	[2] 1,216	[2] 1,409	[2] 1,438	[2] 2,154	[2] 2,014	[2] 2,157

[1] Comparable figures for 1915–31, inclusive, are shown in table 3, p. 15, Domestic Commerce Series No. 99, Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce.
[2] Revised.

Table 5.—Estimated Value of New Public Construction, by Ultimate Source of Funds and by Ownership [1] (Excluding Work-Relief Construction)

[Millions of dollars]

Item	1932	1933	1934	1935	1936	1937	1938
I. Ultimate source of funds: [2]							
Total public funds	[3] 1,794	[3] 1,216	[3] 1,409	[3] 1,438	[3] 2,154	[3] 2,014	[3] 2,157
Non-Federal funds	[3] 1,334	[3] 707	[3] 794	[3] 616	[3] 881	[3] 845	[3] 1,089
Federal funds, total	460	509	[3] 615	[3] 812	[3] 1,273	[3] 1,169	[3] 1,068
Federal projects	283	312	[3] 365	[3] 427	[3] 501	[3] 524	[3] 515
Federal-aid to highways	177	195	243	250	288	[3] 299	223
P. W. A. grants		2	44	104	324	230	192
Work-relief included in table 4				25	100	120	135
II. Ownership:							
Total public ownership	[3] 1,794	[3] 1,216	[3] 1,409	[3] 1,438	[3] 2,154	[3] 2,014	[3] 2,157
Non-Federal ownership, total	[3] 1,511	[3] 904	[3] 1,091	[3] 1,002	[3] 1,653	[3] 1,490	[3] 1,639
Municipal	[3] 661	[3] 301	[3] 327	[3] 387	[3] 675	[3] 613	[3] 712
State and county	[3] 850	[3] 603	[3] 764	[3] 614	[3] 978	[3] 877	[3] 927
Federal ownership	283	312	[3] 365	[3] 427	[3] 501	[3] 524	[3] 518

[1] Comparable figures for 1915–31, inclusive, are shown in table 3a, p. 19, Domestic Commerce Series No. 99, Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce.
[2] Federal funds include expenditures for Federal projects and Federal grants (but not Federal loans) to States and localities for construction purposes. Non-Federal funds include amounts raised by States and localities from current taxation and from borrowings (whether from private investors or from the Federal Government).
[3] Revised.

In 1938, for the first time in 4 years, new Federal construction expenditures (excluding loans to State and local governments for construction purposes but including grants for this use) were smaller than new construction expenditures to be met from funds of State and local governments. New Federal construction expenditures (as so defined), however, were higher than in any year prior to 1936 except 1918 and 1919, when expenditures for war projects were very large. On the other hand, new public construction to be financed from funds of State and local governments (whether these funds were raised by current taxation or were borrowed from private investors or from the Federal Government) was still less than half of the average for the period 1927–31, though it was approximately 50 percent higher than in 1933. In large part, this great reduction in new construction expenditures to be met from non-Federal funds has been counterbalanced by Federal grants to States and localities for construction purposes and by direct Federal construction of projects to be owned and used by the local governments. New construction expenditures on works to be owned by States and localities (whether financed by non-Federal or by Federal funds) were about 35 percent less in 1938 than in the peak year 1930, and only about 30 percent less than the average between 1927 and 1931. When allowance is made for those new construction expenditures on W. P. A. projects which are excluded from the figures just cited, it seems quite probable that expenditures for new construction work to be owned by States and localities were substantially as high in 1938 as in any previous year, with the possible exception of 1930.

Table 6.—Estimated Expenditures for the Maintenance of Fixed Works and Structures [1]

[Millions of dollars]

Item	1932	1933	1934	1935	1936	1937	1938
Railroads	360	312	375	404	457	504	506
Street railways	62	47	53	53	72	68	59
Light and power	44	40	45	49	[2] 55	[2] 68	65
Telephone and telegraph	58	56	60	62	67	68	78
Pipe-lines	6	6	8	11	10	12	14
Gas	[2] 18	[2] 17	[2] 19	19	21	20	20
Highways	468	378	438	468	488	485	500
Rivers and harbors	34	34	35	38	39	[2] 41	45
Water supply and sewage disposal	78	62	65	69	72	76	75
Buildings, residential and nonresidential	650	570	700	800	1,170	1,240	1,226
Total	[2] 1,752	[2] 1,543	[2] 1,793	2,063	[2] 2,452	[2] 2,572	[2] 2,573

[1] Comparable figures for 1915–31, inclusive, are shown in table 5, p. 22, Domestic Commerce Series No. 98, Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce.
[2] Revised.

Table 7.—Estimated Work-Relief Expenditures for Construction Purposes [1]

[Millions of dollars]

Type of work	1932	1933	1934	1935	1936	1937	1938
Construction not included in table 4 [2]	.....	114	578	409	1,130	770	1,203
Highways, roads, streets, etc.	.....	67	384	243	609	450	605
Public buildings	.....	15	67	30	65	86	70
Housing	.....	.....	.....	1	2	1	3
Public recreational facilities	.....	2	15	44	94	49	48
Irrigation and water conservation	.....	.....	.....	7	73	53	49
Electric utilities	.....	1	7	4	4	4	4
Water supply	.....	5	22	14	41	36	46
Sewage systems	.....	20	66	46	129	89	122
Transportation facilities	.....	.....	.....	1	50	34	40
Miscellaneous	.....	4	17	12	.....	.....	.....
Construction included in table 4 [3]	.....	.....	.....	25	108	130	135
Work-relief construction total	.....	114	578	434	1,238	895	1,337

[1] Includes estimated construction expenditures of the Civil Works Administration, the Federal Emergency Relief Administration, the Works Progress Administration and the Civilian Conservation Corps. Includes both new work and maintenance. Excludes expenditures for educational, professional, and clerical projects and other projects not considered to involve construction. For a fuller explanation, see Tables 53 and 54, Domestic Commerce Series No. 98, Construction Activity in the United States, 1915–37, published by the Bureau of Foreign and Domestic Commerce.
[2] The figures here presented for several of the categories have been reduced below those appearing in the Treasury Department reports. This reduction has been made to avoid double counting for certain construction which is included in Table 4 and to omit items that are not considered to be construction. The categories concerned, and the proportion of the total here included, are as follows: public buildings, one-half; housing, one-half; public recreational facilities, one-third.
[3] Estimated amounts of work-relief construction included in the data for nonresidential building contracts awarded, as reported by the F. W. Dodge Corporation, which are used as the basis for the estimates of nonresidential building in Table 4. Work-relief construction included in Table 4 cannot be separated from the totals there shown and a distribution of this work by type is not available.

Description of Revisions

Data presented in tables 1 to 7 contain revisions resulting from a number of causes. In the first place, many of the data for 1938, and a few of the figures for the years 1935 to 1937, have been revised on the basis of more complete figures from primary sources which have become available since the preliminary estimates were prepared. In addition, other revisions have been made either as a result of changes in the classifications used in the basic sources or as a result of the application of new methods to the same data used in previous estimates.

The estimates for all categories of nonresidential building, both public and private, have been revised because of reclassification of the basic data. Several changes have been made by the F. W. Dodge Corporation in the classification of their figures on contracts awarded, which constitute the basis for our estimates of this type of work. First, a few types of construction, including mainly park construction other than buildings, have been dropped from the category of social and recreational nonresidential building. Second, terminal buildings for railroads, bus lines, and air lines, which were not formerly included in nonresidential buildings, have been shifted into this category and together with a miscellaneous group (formerly distributed among various other types) constitute "Miscellaneous nonresidential building." Third, some shifts of individual projects have been made from one type of nonresidential building to another. The estimates presented in tables 2 and 4 for nonresidential building have accordingly been revised, beginning with 1932.

The estimates for nonresidential building have been further revised by changing the method of computation beginning with 1932. Previously, construction expenditures in any year were estimated from annual figures for work started, adding one-half of the estimated work started in the preceding year and one-half of the work started in the year in which the actual construction activity is assumed to have taken place.[5] However, because of the large volume of contracts awarded in the various P. W. A. programs in the last few months of each of the years 1933, 1935, and 1938, this method of estimate has in these years yielded rather unsatisfactory results. In general, it has tended to ascribe too much activity to the years 1933, 1935, and 1938, and too little to the years 1934, 1936, and 1939. The new method is intended to make a more precise allowance for the lag between the start of work and the actual expenditures, especially in these years of unusual changes; though in more normal years it yields substantially the same results as the former method. In this new method, the assumption has been

[5] For factory building, the fractions used were one-third and two-thirds, respectively.

made that expenditures are evenly distributed over a 12-month period beginning at the middle of the month in which the contract was awarded. Thus, the value of contracts awarded in each month has been distributed over that month and each of the following 12 months, giving one twenty-fourth of the total amount to the first month, two twenty-fourths to each of the next 11 months, and one twenty-fourth to the final month. The estimate for each calendar year was then arrived at by adding all of the amounts assigned to months within that year.[4] The same adjustments for partial coverage of the Dodge contract data were made as in the original estimates. It has been possible to test this method by applying it to monthly data for P. W. A. contracts awarded and by comparing the results with known annual figures on P. W. A. reported project costs. For these data and for this period, the method indicated yielded satisfactory results.

A further change in the estimates of several of the types of nonresidential building has been in the method of dividing the total work between public and private construction. The distribution used in our former estimates for the years 1935 and 1936 was based on the ratio of public to private contracts during the year in question, as reported by the F. W. Dodge Corporation. This ratio, however, like the estimate of total expenditures, was adversely affected by the bunching of P. W. A. contracts at the end of several calendar years. In the present estimates, this difficulty has been largely overcome by using for any year the average of the ratio for the year in question and that for the preceding year.

The revision in the estimate for residential construction for 1938 has been due partly to utilization of basic data for 12 months, in place of data for 9 months used in the original estimate. The estimate for residential construction continues, as in the past, to be based on building-permit data compiled by the Bureau of Labor Statistics.

Two further revisions have been made, both of them in items which are small in proportion to the total volume of construction. The estimates for municipal public-service enterprises have been revised for the years 1932 through 1935. This revision consists of deduction of the construction expenditures of the New York City subway system, which, because of inaccurate description of the underlying data, had been included twice for these 4 years.

The other minor revision has been in the estimates of pipe-line construction, which have been revised for the period beginning with 1932. In the figures previously published, pipe-line construction was estimated from data for the pipe-line companies reporting to the Interstate Commerce Commission, using as the basis for the estimate the charges to the appropriate investment accounts. It has become evident, however, that charges to these investment accounts represent in many cases merely purchases or sales of existing property or accounting transfers. In arriving at the revised estimates presented in table 3, therefore, the charges to the investment accounts have been adjusted by making allowance for those charges which did not arise from construction activity. Where the charge was clearly an accounting transfer or was the result of a purchase of existing property, it has been excluded. Where the charge was clearly associated with new construction, or where there was no evidence to the contrary, it has been included in the estimates. The transition from construction expenditures by companies reporting to the Interstate Commerce Commission to construction expenditures for all companies in the United States has been made in the same manner as in the original estimates. It is probable that the resulting estimates are still somewhat indirect and are subject to error, with respect both to the amount of construction and to its timing. However, the new figures should be more satisfactory than the original estimates, and should suffice to give at least a rough idea of the level and fluctuations of pipe-line construction.

[4] For example, the estimate for 1935 included 1/24 of the amount of contracts awarded in January 1937, 3/24 of the amount in February 1937, 3/24 of the amount in March 1937, and so on, including 3/24 of the amount in December 1937, 3/24 of the amount in January 1938, 3/24 of the amount in February 1938, and so on to 1/24 of the amount in December 1938. For factory building, the contract values were distributed over 9 months instead of 12, and the fractions used were correspondingly different.